

# CHAPTER 9, FORM B, PAGE 2

9. Use properties of logarithms to write the following as a sum, difference, or product of logarithms.

$$\log_3 \frac{\sqrt[3]{y^2}}{x^2 z^3}$$

9. \_\_\_\_\_

Use a calculator to find approximations for each of the following logarithms. Express answers to four decimal places.

10.  $\ln 247$

10. \_\_\_\_\_

11.  $\log_7 60$

11. \_\_\_\_\_

12. What values of  $x$  cannot possibly be solutions of the following equation?

12. \_\_\_\_\_

$$\log_a (4x - 1) = -2$$

13. Between what two consecutive integers must  $x$  be if  $5^x = 40$ ? Explain why this is so.

13. \_\_\_\_\_

Use properties of logarithms to solve each equation. Express answers to four decimal places.

14.  $19^{(2/3)w+6} = 149$

14. \_\_\_\_\_

15.  $\log_4 (r - 8) = 3$

15. \_\_\_\_\_

16.  $\log_4 (x + 4) - \log_4 (x - 4) = \log_4 3$

16. \_\_\_\_\_

17. The number of bacteria in a certain culture is given by the function  $B(t) = 300,000e^{0.5t}$ , where  $t$  is the time in hours after the beginning of the experiment.

a. How many bacteria will be present after 48 hours?

17. a. \_\_\_\_\_

b. How long, to the nearest tenth of an hour, will it take the number of bacteria in the culture to double?

b. \_\_\_\_\_

18. The temperature of a liquid  $t$  minutes after being placed into an environment having constant temperature  $T_0$  is given by  $T(t) = T_0 + 100e^{-2t}$ .

18. \_\_\_\_\_

How long, to the nearest minute, will it take a bowl of hot soup to cool to a temperature of  $27^\circ\text{C}$  in a room at  $20^\circ\text{C}$ ?

19. How many years, to the nearest tenth, will be needed for \$1400 to increase to \$2500 at 6.4% compounded monthly?

19. \_\_\_\_\_